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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

PORTKA, GARY J

ART UNIT	PAPER NUMBER
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2188

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	02/27/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No.

09/752,861

Applicant(s)

DAVIS ET AL.

Examiner

Gary J. Portka

Art Unit

2188

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 December 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-13 and 16-28 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-13 and 16-28 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. Claims 12, 13, 18, 19, and 22 have been amended, and claims 14 and 15 have been canceled by Applicant. Claims 1-13 and 16-28 are pending.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 19-20 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 19 recites the limitation "said shared cache descriptor" in lines 1-2. There is insufficient antecedent basis for this limitation in the claim. Claims 20 depends on claim 19.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Elnozahy et al., US 6,701,421 B1, in view of Sayles, US 6,549,963 B1.

6. As to claims 1, 13, 16, and 22, Elnozahy discloses *a computer system, article, and method with multiple processors and plurality of resources assigned to node groups* (see Figs. 1 and 2), *wherein a first descriptor of respective topological levels of at least one resource is produced by firmware* (BIOS). See Abstract, col. 1 lines 41-52 (there is

a need to provide operating system awareness of remote resources), col. 2 lines 17-29 ("a configuration table indicative of the systems hardware resources including the system's physical memory is generated in response to a boot event"), col. 4 lines 6-10 ("BIOS 306 may be responsible for creating configuration tables") and 22-26, and col. 4 line 43 to col. 5 line 4; note that BIOS generates the configuration tables, which identifies the nodes and amount of memory on each node, and thus describes topological levels as recited. The configuration tables of Elnozahy do not necessarily teach *a second descriptor of the respective performance of the resources*. However, Sayles teaches the use of firmware to initialize configuration settings that control performance as well as other characteristics of multiple devices attached to a network, the data of the configuration settings thus reading on the second descriptor (see Sayles col. 1 lines 51-56, col. 2 lines 26-33 ("During system initialization, the system may adjust settings in devices coupled to a bus to indicate communications characteristics that are supported by the devices."), col. 2 line 55 to col. 3 line 26 ("... communications characteristics ... may include ... the address space accessible by the devices ... whether special high-rate read or write transfers are supported ..."), and col. 5 lines 13-22 and 35-42). The BIOS in Sayles loads not only configuration information that identifies performance of devices, but also the address space accessible by them (in addition to other characteristics), and thus Sayles teaches what may be interpreted as multiple descriptors generated or produced by firmware. Additionally, Elnozahy teaches that the multinode system therein may contain nodes having multiple devices on a bus (see Elnozahy col. 3 lines 30-40). An artisan would have been motivated to add a

second descriptor of performance of resources to the system of Elnozahy because as taught by Sayles it would have provided the advantages of control over multi-device networks to maintain signal integrity, compensation for different types of power supplies for the devices, and also the ability to change characteristics for testing purposes (see Sayles col. 1 lines 38-42, and col. 5 line 65 to col. 6 line 24). It is apparent from col. 2 lines 21-25, and from the claims of Sayles (which neglect to recite AGP) that the teachings therein are not solely to AGP devices but rather to any system having communication channels with multiple devices. Thus it would have been obvious to one of ordinary skill in the art at the time of the invention to add the second descriptor produced by firmware, because it was a known method to control signal integrity, compensate for power supplies, and allow testing under changing characteristics.

7. As to claim 2, the descriptors taught as described above may be considered first level and primary data structures to the extent recited.

8. As to claim 3, since the configuration table in Elnozahy maps addresses it contains a pointer to a secondary data structure.

9. As to claims 4 and 17, each node has an identifier in Elnozahy.

10. As to claim 5, the identifiers represent multiple interconnect levels as recited since a node may have multiple levels (for example, processor and memory).

11. As to claims 6-7, Elnozahy dynamically updates the descriptor as recited since the HAL modifies the BIOS generated configuration.

12. As to claim 8, Sayles dynamically updates the other descriptor as recited (see col. 5 lines 65-66).

13. As to claims 9, 18, and 25, the descriptor of the prior art combination is selected from a group that includes descriptors of the recited elements.

14. As to claims 10 and 19, since the descriptors of Elnozahy describe the hardware at each node, the interconnects are reflected as recited.

15. As to claims 11, 20, and 26, the descriptor of Sayles may be considered part of the recited elements of the other descriptor in the combination, that of Sayles incorporating the latency as recited.

16. As to claims 12, 21, and 27, since transfer rates are given by Sayles, the average latency which is directly calculable from this is reflected or maintained as recited.

17. As to claims 14 and 15, the medium consists of both recordable storage and modulated carrier.

18. As to claim 23, traversing the data structure must be done in Elnozahy to use the configuration table to identify nodes and hardware therein.

19. As to claim 24, accessing a second data structure is disclosed in Elnozahy since the configuration table maps addresses.

20. As to claim 28, recursively accessing additional data structure levels is inherent to the extent recited since data is accessed at processor and memory levels.

Response to Arguments

21. Applicant's arguments filed December 13, 2006 have been fully considered but they are not persuasive.

22. Applicants have argued that Elnozahy does not qualify as prior art because it is commonly owned. However, the argument is not persuasive because there must be a

statement that the common ownership was "at the time the invention was made". See MPEP 706.02(I)(1).

23. The remaining arguments are a general reiteration of the arguments of the Appeal Brief of January 23, 2006. Those arguments have been responded to in the Examiner's Answer of March 22, 2006. That response is reproduced below.

24. It is first noted that Appellants do not dispute the teaching of any independent claims limitations other than the descriptors. Additionally, Appellants admit that Elnozahy et al. teach firmware to produce the first descriptor, and that Sayles teaches firmware to produce the second descriptor. See brief page 4 last paragraph and page 5 first paragraph (which describe the two references having BIOS (i.e., firmware) that produces descriptors), page 6 lines 3-5 ("At most, Elnozahy et al. teach firmware to produce only one of the two descriptors . . . At most Sayles teaches only one of the two descriptors."), and page 7 lines 13-16 ("Here Elnozahy et al. teach the use the first descriptor . . . While Sayles teaches the second descriptor . . ."). The only issue regarding the first group of claims to be reviewed on appeal, claims 1, 4, 5, 13-17, 22-24, and 28, is whether it would have been obvious to combine the teachings of the firmware that produce each descriptor into a computer system, article, and method as claimed (see brief pages 5-7, sections B and C).

25. The Appellants argument that each reference does not teach or motivate to expand beyond its own descriptor (brief section 7.I., pages 3-7) is untenable in view of the broadness of the independent claims. The claims do not require the two descriptors to be generated by the same firmware, or even to describe the same resource(s).

Claim 1 only requires that two descriptors or resources are produced by firmware in the same multiple processor system. Claim 13 only requires the equivalent of the descriptors, the determining means, to be stored in firmware of the system (the system not necessarily being part of the claimed article). Claim 22 only requires maintaining the respective descriptions as at least one data structure produce by firmware. In no case do these claims require motivation be found to combine the teachings of the references such that the firmware must somehow be combined into a single firmware that produces both descriptors. What is required is a system that has firmware that produces the first descriptor, and firmware that produces the second descriptor. The claimed computer system has multiple processors, which includes the interpretations of multiple processors at a single node, at multiple nodes, and even of multiple computers connected via busses or networks. Each reference teaches the benefits of providing firmware to produce the descriptor described therein, as detailed in the rejections above. Thus, each teaches the benefits of adding their respective described embodiments, including their respective firmware and the descriptor that it produces, to a computer system as claimed.

26. Notwithstanding the response above, each reference teaches firmware that produces data which has been interpreted hereinabove as the claimed descriptors. However, the firmware of each reference produces a plurality of data that may be interpreted as multiple descriptors. Elnozahy as cited hereinabove generates a configuration table that identifies hardware components, and indicates the memory sizes of the nodes. Sayles as cited hereinabove generates data settings in devices that

identify operating characteristics such as accessible address space, number of commands that may be queued, performance characteristics, etc. It is therefore maintained that it would have been obvious to an artisan looking at each of these references that firmware could advantageously generate multiple descriptors, and in particular motivates generation of the descriptors as recited.

27. Appellants argument that neither Elnozahy et al. nor Sayles teach that their respective descriptors are in the form of a data structure (brief section 7.II., pages 7-9) does not provide any evidence preventing the descriptors therein from being interpreted as data structures. A data structure is generally an organization scheme, such as a record or an array, applied to data so that it can be interpreted and so that specific operations can be performed upon that data. As defined in MPEP 2106, a data structure is "a physical or logical relationship among data elements, designed to support specific data manipulation functions." Applicants disclosure does not provide any further narrowing definition. Thus, a configuration table as described in Elnozahy et al., and configuration settings initialized into registers as described in Sayles, may be considered data structures to the extent claimed, since the data must be stored with known physical and logical relationships in order to get the correct configuration data.

Appellants argument that neither Elnozahy et al. nor Sayles teach a dynamic updater (brief section 7.III., pages 9-13) likewise does not provide any support that prevents the updating of the descriptors in the references being interpreted as the dynamic updater. Appellants admit that Elnozahy updates the BIOS (brief page 10), but argues that there is no support for update of a second descriptor. However, it is clear

that in Sayles (see e.g. col. 5 line 65 to col. 6 line 45) that the BIOS routine therein updates the configuration data as needed. Any such updating is dynamic to the extent claimed. Alternatively, Elnozahy teaches multiple descriptors as described hereinabove. Because Elnozahy teaches dynamic update of the BIOS (as admitted by Appellant), Elnozahy thus teaches dynamic update of multiple descriptors, which obviously includes any descriptor added, such as that taught by Sayles.

Conclusion

28. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

29. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gary J. Portka whose telephone number is (571) 272-4211. The examiner can normally be reached on M-F 9:30 AM - 6:00 PM.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hyung Sough can be reached on (571) 272-6799. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

30. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Gary J Portka
Primary Examiner
Art Unit 2188

February 13, 2007

GARY PORTKA
PRIMARY EXAMINER

